



**STATE OF MONTANA
MONTANA DEPARTMENT OF TRANSPORTATION
JOB PROFILE**

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Update

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Formal Review

Date Submitted _____

SECTION I - Identification

Working Title: Drill Operator

Department: Transportation

Job Code Number: 475214

**Division & Bureau: Engineering,
Materials Bureau**

Job Code Title: Drill Operator

Section & Unit: Geotechnical Section

Pay Band: 4

**Work Address: 2701 Prospect Ave.
Helena, MT 59601**

**Position Number: 46019, 46003, 46002, 46012
94620**

Phone: 406-444-6396

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FLSA Exempt

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FLSA Non-Exempt

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Non-Union

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MPEA

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Blue Collar

Profile Completed By: Jeff Jackson

Work Phone: 444-3371

Work Unit Mission Statement or Functional Description:

The Montana Department of Transportation's (MDT) Highways and Engineering Division prepares projects for bidding and coordinates highway construction. The Division is made up of the Materials, Construction, Right-of-Way, Bridge, and Preconstruction Bureaus; the CADD systems and Engineering Management Support Sections; and five District Construction Offices in Missoula, Butte, Great Falls, Glendive, and Billings for budget and workforce purposes.

The principal goals of the Materials Bureau are to develop and implement comprehensive data collection, testing, and analysis programs that facilitate pavement project selection and pavement surface and subsurface design that address Montana's most important statewide transportation needs and to support the quality of materials incorporated into Montana's highway system. These activities help officials select projects and provide information for short and long-range engineering and construction programs. These goals are addressed through

the complex interaction and interrelationship of the Bureau's three Sections. The Bureau consists of the Geotechnical Section, Physical Testing Section, and Pavement Analysis and Research Section.

The Geotechnical Section prepares geotechnical recommendations for design, construction, and repair of the highway system and ancillary maintenance facilities through the performance of field, laboratory, and analytical investigations of soil and rock conditions. Investigation and analysis involves research and evaluation of geological setting, soil and rock strength parameters, slope stability characteristics, groundwater flow, foundation support of bridge and building structures, settlement magnitudes, modification of earth materials, and constructability. Work encompasses preconstruction, construction, and post-construction maintenance phases of highway program and includes interaction with the public and outside consultants.

The field investigation unit conducts vertical, angled, and horizontal bores into soil and rock by means of conventional flight auger, hollow stem auger, and rotary drilling methods using carbide and diamond bits. During the course of drilling, samples of the soil and rock are obtained and in-situ tests are performed by various methods. Most typically, borings are less than 100 feet in depth and seldom exceed 200 feet, but may extend to several hundreds of feet if called for by the specific situation. Major drilling equipment consists of several different types of mobile drilling rigs, support vehicles and equipment, welding machinery, and barge platforms for drilling over water in larger/deeper rivers. Special drilling procedures are employed for the drilling of environmental-related projects requiring the sampling of hazardous materials and installation of wells for environmental monitoring and groundwater sampling. The Unit performs work for MDT's Engineering Division and Maintenance Division, Environmental Bureau; Department of Environmental Quality (DEQ); and outside consultants working on MDT contracts.

Describe the Job's Overall Purpose:

This position serves as a drill operator and conducts a variety of on-site drilling and sampling operations. Duties include operating specialized drilling equipment, gathering and preparing soil and rock samples, and maintaining and repairing drill machinery, equipment, tools, and vehicles. The position reports to the Drill Crew Chief and does not directly supervise other agency personnel.

SECTION II - Major Duties or Responsibilities

This section should be a clear concise statement of the position's major duties and the approximate percent of work time for each duty

% of Time

A. DRILLING OPERATIONS

70%

This position conducts on-site drilling and sampling activities according to the specifications of drilling orders and a variety of federal, State, and Department guidelines, policies, and procedures. This involves operating a variety of specialized drilling equipment; performing in-place soil strength tests and sampling; installing monitoring wells; installing specialized monitoring equipment; obtaining, securing, and preserving soil and rock samples; performing boring layout activities; and transporting drilling equipment, tools, and sampling instruments to field sites. These duties require knowledge of specialized core drilling operations, equipment, and tools; techniques of

sample collection and preservation; boring layout; and Federal, State, and Department drilling policies and procedures. These duties also require skill in the safe and effective operation of heavy and hazardous machinery, tools, and vehicles, and the ability to work effectively with a team of drillers and in potentially hazardous environments and inclement weather.

1. Operates a variety of specialized drilling equipment (e.g., rotary drill rigs, hollow stem augers, conventional and wire line core barrels, casing advancers, etc.), for subsurface soils investigations, monitor wells, and instrument installation according to defined drilling and mobilization standards provided for in the International Drilling Federation Drilling Safety Guide and the MDT Safety Policies and Procedures Manual to obtain geologic and hydro geologic information for use in determining roadway and facility designs.
2. Performs in-place soil strength tests and sampling by assembling drilling pipe and sampling devices (e.g., Lynac split tube samplers, Shelby tube undisturbed samplers, Dutch Cone electrometers, conventional and wire line core barrels, etc.), in their proper sequence according to the type and structural conditions of the bore hole to gather and report soil engineering properties.
3. Installs monitoring wells, under the direction of the Drill Crew Chief and standards established by the Montana Board of Water Well Contractors, using specialized drilling equipment, filter packs, seals, locking wells caps, etc., to monitor water levels, the presence or absence of groundwater contaminants, and protect against wellhead tampering by unauthorized persons.
4. Installs specialized monitoring equipment, including borehole inclinometers, piezometers, filter packs, and bentonite seals, etc., to determine slope stability and/or the amount of movement of soil and the specific plane of the movement in a landslide and the hydro geologic properties of groundwater. This involves positioning drilling equipment relative to the anticipated slide plane and/or water table and installing the required casing, grouting, filter packs, and seals to ensure the immobility of the necessary instruments and the accurate collection of data.
5. Obtains, secures, and preserves soil and rock samples to be used for laboratory testing and analysis. This involves labeling, preparing, and securing the samples for shipment using a variety of specialized collection and preservation products to ensure undisturbed samples are delivered according to AASHTO and ASTM guidelines.
6. Performs boring layout activities by reviewing the drill project order and sampling requirements and selecting the appropriate boring layout instruments to obtain proper layout, location, and elevation of drill sites and individual borings.
7. Transports drilling equipment, tools, and sampling instruments to field sites throughout the state. This involves reviewing the drilling order, determining the equipment and tools necessary to complete the project, and gathering back-up equipment when available to ensure that the project is completed and samples are collected in the most cost-effective and efficient manner.

B. EQUIPMENT MAINTENANCE, REPAIR, AND TRANSPORTATION

25%

This position maintains, repairs, and recommends the acquisition of specialized drilling equipment, tools, and sampling products for use in field operations. This involves maintaining and repairing specialized drilling equipment and tools; resolving drilling and sampling equipment malfunctions, deficiencies, and other problems in the field; identifying maintenance and repair needs and preparing supply request orders; recommending the acquisition of drilling equipment and tools; and inspecting incoming vendor shipments of supplies and equipment. This requires knowledge of ..., skill in specialized and general maintenance techniques and processes and diagnostic analysis, and the ability to monitor field operation equipment needs and recommend equipment and supply purchases.

1. Maintains and repairs specialized drilling equipment and tools, (e.g., truck mounted, all-terrain, skid mounted, and barge drill rigs, support vehicles, drill transports, bits and bores, etc.), to ensure the safe and effective operation. This involves assessing equipment and tool conditions, reviewing Department maintenance schedules, product manufacturer's repair guides, and following through with the necessary maintenance and repair tasks.
2. Resolves drilling and sampling equipment malfunctions, deficiencies, and other problems in the field to ensure accurate, safe, and effective operation. The incumbent develops approaches to specific equipment problems by researching or identifying technical documentation, performing hands-on repair or adjustments, and testing the results to ensure that the appropriate repairs have been made.
3. Identifies maintenance and repair needs and prepares supply request orders according to established purchasing and requisition policies and procedures. This involves continually monitoring shop inventories, identifying immediate needs and anticipating future needs (e.g., based upon known plans or projects), and submitting the requests to the appropriate staff.
4. Recommends the acquisition of drilling equipment and tools by reviewing manufacturer's literature and provides background justification to the Unit Manager establishing ways in which the new technology purchases would increase the Unit's efficiency and core drilling sampling results.
5. Inspects incoming vendor shipments of supplies and equipment to ensure quality and security of materials. Verifying quantity, storage requirements, invoices, and other receiving details to verify accuracy and completeness. This involves physical inspection of packages, pallets, and contents to identify damage, missing or lost inventory, and/or other problems and coordinating with vendors and other staff to resolve problems.

C. OTHER DUTIES

5%

This position performs a variety of other duties assigned by the Drill Crew Chief and Field Investigation Unit Manager in support of ongoing Unit and Section operations.

This includes participating in ongoing training and educational programs as directed, consulting with technical experts, and promoting effective relationships with professional consultants, contractors, other agency personnel, and the public.

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1. ***The following duties and/or specific tasks listed under section II above are considered “essential functions” because they require specialized expertise and skill and are the primary reasons the job exists (they must be performed by this position with or without accommodations):***

Duties A & B

The following mental and physical demands are associated with these essential functions:

PHYSICAL

- Lifting heavy objects up to 75 lbs.
- Ability to walk over uneven terrain or in water
- Operating a personal computer
- Communicate in writing, in person, and over the phone
- Exposure to extreme weather
- Exposure to loud noises
- Exposure to high-speed traffic
- Extensive travel and long hours

MENTAL

- Demands for accuracy in all aspects of work
- Ability to meet inflexible deadlines
- Decision making that affects public health and safety
- Perform duties under stressful conditions

2. ***Does this position supervise others?*** ☐ ☐ Yes ☒ No

Number directly supervised:

Position Number(s) of those supervised:

3. ***Attach an Organizational Chart.***

SECTION III - Minimum Qualifications - List minimum requirements for the first day of work.

Critical knowledge and skills required for this position:

KNOWLEDGE:

This position requires thorough knowledge of the methods and techniques of subsurface drilling and sampling; Environmental Protection Agency regulations governing safety and

techniques of drilling and sampling soil and water known to be contaminated with hazardous materials; methods and techniques used in monitor well installation and abandonment as well as precautions against cross contamination of groundwater resources; and applicable State, federal, AASHTO, and FHWA requirements and standards. The position also requires a working knowledge of land surveying principles.

SKILLS:

This position requires skill in operating, maintaining, and repairing specialized drilling and sampling equipment and tools, vehicles, and various drilling support equipment and hand tools.

Behaviors required to perform these duties:

See MDT Core Behaviors

Education:

Check the one box indicating minimum education requirements for this position for a new employee the first day of work:

- | | |
|--|---|
| <input type="checkbox"/> <input type="checkbox"/> No education required | <input type="checkbox"/> <input type="checkbox"/> Related AAS/2-years college/vocational training |
| <input checked="" type="checkbox"/> High school diploma or equivalent | <input type="checkbox"/> <input type="checkbox"/> Related Bachelor's Degree |
| <input type="checkbox"/> <input type="checkbox"/> 1-year related college/voc. training | <input type="checkbox"/> <input type="checkbox"/> Related Master's degree |

Please specify the acceptable fields of study:

Acceptable:

Other education, training, certification, or licensing required (specify):

Experience:

Check the one box indicating minimum work-related experience requirements for this position for a new employee the first day of work:

- | | |
|--|---|
| <input type="checkbox"/> <input type="checkbox"/> No prior experience required | <input type="checkbox"/> <input type="checkbox"/> 3 years |
| <input type="checkbox"/> <input type="checkbox"/> 1 year | <input type="checkbox"/> <input type="checkbox"/> 4 years |
| <input checked="" type="checkbox"/> 2 years | <input type="checkbox"/> <input type="checkbox"/> 5 or more years |

Other specific experience (optional): two years progressively responsible experience in core drilling operations, soil sampling, diamond drilling, water exploration, and horizontal drilling.

The incumbent must possess and maintain a valid Class A/Type 2 driver's license with air brake, hazardous material, and tanker endorsement.

Alternative Qualifications:

This agency will accept alternative methods of obtaining necessary qualifications.

☒ Yes ☐ ☐ No

Alternative qualifications include: Training assignments may be considered and will be evaluated case by case.

SECTION IV – Other Important Job Information

☐ ☐ Fingerprint check

☒ Valid driver's license

☐ ☐ Background check

☐ ☐ Other; Describe

Other information including working conditions such as shifts, lifting requirements, travel or hours.

The majority of work is performed at various field project locations involving extensive statewide travel (in excess of 12,000 miles a year) as well as hazards and demands associated with an active project site, including exposure to high-decibel noises and heavy equipment; traversing rough and uneven terrain; and extreme weather and driving conditions. The incumbent must be able to lift and transport supplies, samples, and equipment weighing in excess of 75 pounds. Unanticipated project problems, safety concerns, and other impediments require the incumbent to work long hours under stressful and demanding conditions.

SECTION V – Signatures

Signature indicates this statement is accurate and complete.

Employee:

Name: _____ Title: _____

Signature: _____ Date: _____

Immediate Supervisor:

Name: _____ Title: _____

Signature: _____ Date: _____

Bureau Chief:

Name: _____ Title: _____

Signature: _____ Date: _____

Division/District Administrator:

Name: _____ Title: _____

Signature: _____ Date: _____

Department Designee:

Jennifer Jensen/Designee

Chief Human Resources Officer
Human Resources Division

Signature: _____ Date: _____